Propranolol is a drug from the group of non-selective beta blockers. It blocks both beta-1 receptors and beta-2 receptors. Beta-1 receptors are found in the heart, and their blockage causes a reduced contractile strength of the heart and slow heart rate while beta-2 receptors are found in the smooth muscles of the respiratory tract, and their blockage causes bronchoconstriction.

Propranolol is used in the treatment of the following conditions:

- Hypertension
- Tachycardia *(rapid heartbeat)*
- Angina pectoris
- Tremor
- Prevention of migraine attacks
- Prevention of upper gastrointestinal tract bleeding
- Pheochromocytoma *(in combination with other drugs)*
- Adjunctive therapy in the treatment of thyrotoxicosis

**Contraindications and precautions**

Propranolol is contraindicated in the following conditions:

- Bronchial asthma. As already mentioned before, Propranolol blocks beta-2 receptors in the airways, which causes narrowing of the bronchi and this can cause asthma attacks. These asthma attacks can be controlled by taking the beta-2 agonists *(such is salbutamol)* but only if taken in large doses.
- Bradycardia (*slow heart rate*). Propranolol slows the heart rate, and should not be used in patients who have bradycardia.
- Second or third-degree AV block
- Low blood pressure (*hypotension*).
- Cardiac insufficiency. Propranolol exhibit negative inotropic effect (*reduces the contractile strength*) and should be avoided in patients who have cardiac insufficiency.
- Metabolic acidosis.
- In patients who are on long-term calorie-deficit diet
- Peripheral artery diseases

Propranolol may mask the symptoms of hypoglycemia (*e.g. tachycardia*) in diabetic patients, and must be used with caution in these patients.

Propranolol therapy should not be discontinued abruptly, but gradually reducing the dose over the 14 days.

### Propranolol, pregnancy and breastfeeding

In a study that involved 28 pregnant women, Propranolol was compared to Methyldopa (*a drug that is also used to treat hypertension and is approved for use during pregnancy*) and one baby whose mother took Propranolol had symptomatic hypoglycemia. Given that Propranolol can cause hypoglycemia and bradycardia in neonates, its use should be avoided during pregnancy.

It is excreted into breast milk and should be cautiously used during breastfeeding.

### Dosage

The recommended dosage is in the table below:

<table>
<thead>
<tr>
<th>Indication</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>High blood pressure</td>
<td>Initial dose: 80 mg two times a day</td>
</tr>
<tr>
<td></td>
<td>Maintenance dose: 160 â€“ 320 mg daily</td>
</tr>
<tr>
<td>Angina pectoris</td>
<td>Initial dose: 40 mg two or three times a day</td>
</tr>
<tr>
<td></td>
<td>Maintenance dose: 120-360 mg daily</td>
</tr>
<tr>
<td>Tachycardia</td>
<td>10-40 mg, three or four times a day</td>
</tr>
<tr>
<td>Migraine prevention</td>
<td>Initial dose: 40 mg, two or three times a day</td>
</tr>
<tr>
<td></td>
<td>Maintenance dose: 80 -160 mg daily</td>
</tr>
<tr>
<td>Tremor</td>
<td>Initial dose: 40 mg, two or three times a day</td>
</tr>
<tr>
<td></td>
<td>Maintenance dose: 80 -160 mg daily</td>
</tr>
<tr>
<td>Prevention of upper gastrointestinal</td>
<td>Initial dose: 40 mg two times a day</td>
</tr>
<tr>
<td>bleeding</td>
<td>Maintenance dose: 160 â€“ 320 mg daily</td>
</tr>
</tbody>
</table>

Swallow the tablet whole with 8 fl. oz. (250 ml) of water. Food does not affect Propranolol effectiveness, so tablets can be taken with or without food.
Interactions

Propranolol enters into major interactions with the following drugs:

- **Beta-2 agonists** (*drugs used for the asthma treatment*), such as: salmeterol, formoterol and salbutamol. These drugs are the agonists of beta-2 receptors, while Propranolol acts antagonistically on these receptors, and therefore these drugs must not be taken simultaneously.
- **Aminophylline and theophylline** (*drugs used to treat asthma*). These drugs reduce the effectiveness of the Propranolol.
- **Arbutamine** (*a drug that has a positive inotropic effect and is used for diagnostic purposes*). This drug is agonist of beta-receptors in the heart and can antagonize the effects of Propranolol.
- **Atazanavir** (*a drug used for HIV treatment*). Co-administration of Propranolol with this drug increases the risk of arrhythmia.
- **Calcium antagonists** (*e.g. diltiazem and verapamil - medicines used to treat heart disease*). Co-administration of these drugs with Propranolol increases the risk of bradycardia.
- **Disopyramide** (*antiarrhythmic*). Concomitant use of these drugs increases the risk of arrhythmia.
- **Dolasetron** (*a drug used to treat chemotherapy-induced nausea*). Concomitant use of these drugs increases the risk of arrhythmia.

Propranolol should not be administered concurrently with alcoholic beverages.

Side effects

Propranolol is usually well tolerated and most of its side effects are mild.

The following side effects may occur:

- Bradycardia
- Orthostatic hypotension
- Dizziness
- Hypoglycemia
- Numbness in the hands and feet
- Dry eyes
- Visual disturbances
- Transient alopecia
- Hallucinations
- Nightmares
- Allergy

References

1. NCBI link